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Marine Casualty Investigations

Enquêtes sur les accidents maritimes

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE COLLISION BETWEEN THE BARGE "SEASPAN 610" AND THE SMALL FISHING VESSEL "VIVIAN O", ON THE FRASER RIVER, B.C. WITH THE SUBSEQUENT LOSS OF TWO LIVES, ON SEPTEMBER 29, 1986.

REPORT No. 467

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

Ce rapport est aussi disponible en français.

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Particulars of Fishing Vessel

Name	"VIVIAN O"
Licence Number	13K39572
Port of Licence	Vancouver, B.C.
Gross Tonnage	7
Net Tonnage	4
Length	10.36 m
Breadth	3.05 m
Depth	1.22 m
Type	Wooden, Gillnet/Troller
Built	1966
Propulsion	Ford, 6 cylinder 165 h.p. gasoline engine. Driving one fixed-pitch propeller, controlled from the wheel-house.
Cargo	None
Crew	2
Owner/Operator	Djenko Jadrijev, Vancouver, B.C.

Navigating Equipment

Radar	Furuno FRS-24
Auto Pilot	Wagner MK2
Radar Reflector	Fitted
CB Radio	Lafayette 323
VHF Radio	WR 2555

Magnetic Compass	Fitted
Echo Sounder	Echo Lite Flasher

Safety Equipment

Dinghy (1)	Fibreglass, 2 persons
Life Vest (1)	Non-approved
Life Ring (1)	Non-approved
Fire Extinguisher (1)	1.13 kg Dry Chemical

Particulars of Commercial Vessels:

	TUG	BARGE
Name	"SEASPAN VALIANT"	"SEASPAN 610"
Official Number	331847	323846
Port of Registry	Vancouver, B.C.	Vancouver,B.C.
Gross Tonnage	109.65	2188.21
Net Tonnage	7.2	2188.21
Length	20.51 m	61.57 m
Breadth	6.89 m	14.66 m
Depth	2.87 m	3.60 m
Draught (at time of casualty)	1.83 m Forward 2.13 m Aft	2.40 m 2.40 m
Type	Steel Tug	Steel Barge
Built	1969, Vancouver, B.C.	1965, Victoria, B.C.
Propulsion	1 Diesel Engine, 765 b.h.p., driving a single fixed-pitch propeller	None
Cargo	None	914 tonnes, wood pulp

Crew	5	None
Owner/Operator	Seaspan International Limited North Vancouver, B.C.	

Navigating Equipment

		TUG	Barge
Radar	(1)	Decca, Model 916	None
	(2)	Decca, Model 914	
Echo Sounder		Ross, Model 600	
SSB Radio		Marconi, CH25	
VHF Radio	(1)	Apelco, AF 40M	
	(2)	Apelco, AF 40MA	
Gyro Compass		Sperry	
Auto Pilot		Sperry	

Note: 1. All times in this report are expressed in Pacific Daylight Saving Time (UTC minus 7 hours).

2. A glossary of abbreviations and terms can be found following the Findings in this report.

Background

In the early morning of September 29, 1986, the small fishing vessel "VIVIAN O", when returning from the fishing grounds north of Sand Heads light at the mouth of the southern entrance to the Fraser River, was in collision with the loaded barge "SEASPAN 610" which was in tow of the tug "SEASPAN VALIANT. All three vessels concerned were proceeding in the same general direction up the river. The fishing vessel "VIVIAN O" capsized, trapping her crew of two inside the accommodation where their bodies were subsequently found and recovered.

The collision is reported to have occurred in position latitude 49°06.35'N, longitude 123°17.85'W, approximately 340 metres south-east of Sand Heads Light, at 0046 on September 29, 1986.

The "VIVIAN O" was also recovered and is considered a constructive total loss with an insured value of approximately $40,000.

No pollution was reported following this casualty.

Particulars of Deceased

Name	Djenko Jadrijev
Position on board	Owner/operator, "VIVIAN O"
Age	47
Address	Vancouver, B.C.
Cause of Death	Drowning

Name	Franko Jadrijev,
Position on board	Deck-hand, "VIVIAN O"
Age	21
Address	Vancouver, B.C.
Cause of Death	Drowning

Narrative

The "VIVIAN O" was purchased by her owner/operator in January 1986 and registered in his name on January 16, 1986. During the following winter months the vessel was moored at Steveston on the Fraser River, where minor repairs were effected in order to ready the vessel for the summer fishing season.

The first Fraser River salmon fisheries opening, a one day period from 0800 September 24 to 0800 September 25, had been fished by the operator and his son. They returned home at about 1100 on September 25, slept for approximately two hours and then went back to the boat to prepare for the next opening which was scheduled from 1800 September 27 to 0800 September 29, a 38 hour period.

The operator of the "VIVIAN O" had been in frequent touch by land-line telephone with the Federal Department of Fisheries regarding the opening scheduled for the 27th and it is reported that he left his home in Vancouver at about 1600 on the 27th in order to reach the fishing grounds and commence fishing by 1900 the same day. It was further reported that he was well rested and that the "VIVIAN O" was in readiness for fishing as he and the other crew member had utilized the interval between the openings by mending nets and cleaning the vessel.

There were no reported difficulties during the outbound trip of some 6 miles to the fishing grounds; the exact destination is not known but it is presumed that the next 30 hours or so were spent fishing on the north-east side of Sand Heads Light (see copy CHS chart 3490). There was a group of about 8 to 10 fishermen of the same ethnic origin who worked loosely together among the estimated 100 fishing vessels in the area; they communicated amongst themselves on channel 10 of their CB

radiotelephones, and occasionally on channel 78B VHF radiotelephones.

The operator of the "FREELANCER", a friend of the operator of the "VIVIAN O", had been fishing the same salmon opening and was the last known person to have been in radio contact with the "VIVIAN O", at approximately 0010, September 29, using CB channel 10. At the time of the above contact, and some 36 minutes before the casualty, the "FREELANCER" had completed fishing and both vessels were inbound for Steveston with the "FREELANCER" approximately 15 minutes ahead of the "VIVIAN O".

The weather at that time was reported by the other fishermen as being misty with rain and a visibility of about 10 miles; Vancouver airport lights, distant some 8 miles could be seen. The wind was estimated to be from the south-east at about 20 knots, making the sea choppy, i.e. short, steep seas approximately 60 centimetres high.

Meanwhile, the tug "SEASPAN VALIANT", towing the loaded barge "SEASPAN 610", had departed Crofton on Vancouver Island at 2140, September 28, bound for New Westminster some 18 miles up the Fraser River and at 2345 was 2 miles west of Buoy TA which is approximately 3.5 miles south-west of Sand Heads Light. Due to the high concentration of fishing vessels in the area and the possibility of course alterations, the towline had been shortened in order to increase manoeuvrability, to an approximate length of 180 metres measured from the stern of the tug to the bow of the towed barge.

A routine VHF radiotelephone safety call was made to the Fraser River Vessel Traffic Service (VTS) at midnight, followed by a call to advise them that the "SEASPAN VALIANT" was about to switch to, and continuously monitor, channel 74 VHF in accordance with their requirements.

Various courses and speeds were followed by the tug and tow during the passage through the fishing fleet; the master had been relieved by the mate at midnight but remained on the bridge with the mate throughout the passage through the fleet; at 0043, the greatest concentration of fishing vessels had been cleared and the tug passed abeam of Sand Heads Light while on a course of 057° true and in line with the inbound range lights of the Fraser River. The speed of the tug and tow at the time is reported to have been 4 to 5 knots over the ground, with the engine turning at 1100 r.p.m. There was little tidal effect as the flood tide was meeting and was approximately equal to the outward current of the river.

The master and mate were standing in the wheel-house, the mate steering by use of the hand steering system and the master

standing on the starboard side of the wheel-house in front of the radar. A few minutes after passing Sand Heads and having entered the buoyed channel at the entrance to the River, the mate looked astern and saw the lights of a fishing vessel through the port after window. The lights appeared to him to be the port and starboard sidelights plus masthead light; the fishing vessel was also displaying her fishing and deck lights. He immediately informed the master who also looked astern and saw a fishing vessel very close to the port bow of the barge. The tug's engine speed was immediately reduced to 800 r.p.m. But by that time, the fishing vessel had moved in front of the barge; the tug's engine was then stopped in order to slacken the towline and allow it to sink giving the fishing vessel sufficient depth of water to pass above; however, as the master and mate watched helplessly, the fishing vessel was caught under the bow of the barge, rolled under it and disappeared. The time of the incident was reported to be 0046, September 29, 1986.

The master immediately reported the casualty to Vancouver VTS who advised the Rescue Co-ordination Centre (RCC) in Victoria at 0049 and a 'Mayday' relay was broadcast.

By 0051, 3 minutes later, the fishing vessel "CONCORDE 101" which was also proceeding upriver, chanced upon the overturned hull and reported to VTS an overturned vessel floating keel uppermost. The "CONCORDE 101" made a search of the area but found no survivors.

Meanwhile RCC tasked the Department of Fisheries vessel "JAMES SINCLAIR" which was in the area, and also tasked 2 Canadian Coast Guard Hovercraft, the "086" and the "039" which were at their base at Kitsilano, Vancouver, some 17 miles distant.

The RCC released the tug and tow from their obligation to join the search for survivors due to the restricted manoeuvrability of both vessels and the danger of their drifting into the side of the channel.

Hovercraft "086" arrived at the scene at 0122 (33 minutes after being tasked) and conducted a surface search for survivors without success; Hovercraft "039" arrived some 20 minutes later due to having waited for a team of Search and Rescue Technician (SARTEC) divers.

The "JAMES SINCLAIR" arrived at approximately 0200 and all 3 vessels conducted a surface search under the direction of Hovercraft "086" whose operator had been designated On-Scene Commander by RCC. The seas proved too rough for the divers to safely search under and inside the overturned hull and at 0238 the "JAMES SINCLAIR" took the still capsized "VIVIAN O" in tow

and headed for Steveston and more sheltered waters. In the meantime an RCMP diving team had been alerted to prepare for diving at Steveston. During the tow the "VIVIAN O" showed a tendency to turn on her side and, fearing that entrapped air in the hull might escape and the vessel sink and thus negate any hope of survival of persons possibly trapped in an air pocket within the hull, the tow was stopped and a commercial salvage company was requested to attend the scene and stabilize the vessel.

At 0750, the RCMP vessel "McCLELLAND" left Steveston with the RCMP dive team and arrived on-scene at 0825. The Fisheries vessel "JAMES SINCLAIR" was stood down and the vessel "HYMAC" departed Ladner for the search area with commercial divers and salvage equipment on board.

At 0902 the RCMP vessel "McCLELLAND" was in turn appointed On-Scene Commander and by 1025, two bodies had been recovered from the forward compartment of the "VIVIAN O" by the commercial divers.

Arrangements were made with a private towing company to tow the still capsized vessel to Steveston, and during the evening of September 29, personnel from the towing company assisted by the RCMP dive team, righted the vessel and towed it to a boat lift at a local marina where the vessel was raised for examination.

Analysis

1. Description of Vessels

"VIVIAN O"

The small wooden fishing vessel "VIVIAN O" is typical of her class on the West Coast of Canada. She was built as a combination troller/gillnetter, with a small wheel-house forward of amidships. The steering position is on the port side of the wheel-house with an additional steering position in the after part of the vessel. The engine is located below the wheel-house floor; aft of the operator's position is a small enclosure where a toilet is located. On the starboard side is a low door leading to the forward compartment accessible by way of a short stepladder. Located in the after bulkhead of the wheel-house and opposite the forward compartment door is a sliding door which leads to the deck.

The view from the wheel-house is provided by seven small windows, three forward and two on each side. One forward window, located in front of the operator's position on the port side, is equipped with a windshield wiper and a small fan.

The vessel was fitted with a radar reflector in compliance with the 'Additional Canadian Provisions' Rule 40 Part F (a), of the International Regulations for Preventing Collisions at Sea, 1972.

BARGE "SEASPAN 610"

The unmanned "SEASPAN 610" is an all steel, covered, dry-cargo barge of 2188 gross tons, used on the B.C. Coast to carry mostly wood products. Loading and unloading are made through side or stern doors. The cover or 'house' measurements are: length 49.7 metres, width 13.14 metres, height 4.88 metres. Situated on top of the house, one forward and one aft, are two small steel stands used to hold battery operated navigation lights. The height of the navigation lights above the waterline is estimated to have been 7.3 metres at the time of the accident.

No unusual problems were known to the tug's crew with respect to the handling of the barge and there were no reports of the barge taking any sudden sheers while being towed.

When operating on the west coast of Vancouver Island, the barge is customarily towed from a chain shackled at the centre of the bow but due to the sheltered operation of this voyage, the towing chain was not used as it was more convenient to use the towing wire bridles from the tug.

TUG "SEASPAN VALIANT"

The "SEASPAN VALIANT" is an all steel, coasting tug trading on the British Columbia coast. She has a crew of five, namely a master, mate, engineer, deck-hand and cook. The usual watchkeeping system consists of two persons on each watch working six hours on and six hours off. The master stands the 6 to 12 watch with the deck-hand while the mate stands the 12 to 6 watch with the engineer.

Visibility from the tug is excellent and is provided by large windows located around the wheel-house including two windows located in the after bulkhead which provide a clear view of the tug's stern and beyond, although the crew were unable to see behind the barge.

2. Weather

The Marine forecast issued by Environment Canada at 1145, September 28, for Georgia Strait, was:

> Small craft warning.
> Winds south-easterly 10 to 20 knots shifting overnight to north-west 10 to 20. Cloudy with intermittent rain. Outlook. Moderate to strong north-westerly winds.

The Marine forecast issued by Environment Canada at 1745, September 28, for Georgia Strait, was:

> Small craft warning.
> Winds south-easterly 15 to 25 knots shifting overnight to north-west 10 to 20. Intermittent rain tonight lowering visibility to 4 to 6. Showers Monday.

The Marine weather forecasts were accurate; the weather conditions reported by the local fishermen and the tug master were, south-easterly winds 15 to 25 knots with intermittent rain and drizzle; there was a moderate chop (short, steep seas) in the Sand Heads area; visibility was approximately 10 nautical miles.

The tide had turned to flood at 2245; high water, with a small increase of 0.5 m, would occur at 0255 that morning; however, at the time of the collision, 0046, the tidal stream produced, (current) was not perceptible due to the prevailing south-easterly winds.

Sea spray, due to sea conditions, could have impaired the visibility from a small vessel running at full speed and, although it can be said that the general visibility was good locally, visibility from the wheel-house would depend upon the size of the vessel, her speed and course.

3. Inspection of Vessels

The "SEASPAN VALIANT" held a valid Inspection Certificate issued by the Ship Safety Branch of the Canadian Coast Guard that was short-termed to January 17, 1987, when proper navigation lights were to be installed in accordance with new standards established by International Regulations for Preventing Collision at Sea (1972) Annex 1, section 3(b). These new regulations refer to the repositioning of the mast lights in such a way that the side lights are not forward of the mast lights. However, since the "VIVIAN O" was well abaft the "SEASPAN VALLIANT's" beam and in a position where the tug's mast lights would not be visible to her, the position of the tug's mast lights is not considered to have had any bearing on the collision.

The barge "SEASPAN 610" is unmanned and therefore not

required to be inspected by the Ship Safety Branch of the Canadian Coast Guard and consequently is not issued with an Inspection Certificate.

The fishing vessel "VIVIAN O" being under 15 tons gross tonnage was not required to be inspected by the Ship Safety Branch of the Canadian Coast Guard. In December 1985, a private survey was made of the vessel afloat, for insurance purposes, which reported the vessel to be in excellent condition.

4. Certification and Licencing

The master and mate of the "SEASPAN VALIANT" were properly certificated in accordance with the requirements of the Canada Shipping Act for the operation of the vessel and were properly licenced as required by the Ship Station Technical Regulations for the operation of the marine radios on board the tug.

The fishing vessel "VIVIAN O" was not required by regulation to have a VHF radiotelephone fitted on board but in fact did have one and was therefore subject to regulations under the Radio Act that require the operator of a radio station to hold a licence for that station. The General Radio Regulations require the operator of a VHF radiotelephone to hold a Restricted Radiotelephone Operator's Certificate; the operator of the "VIVIAN O" did not hold a Ship Radio Station licence nor an operator's certificate.

The operator of the "VIVIAN O" held no formal marine qualifications, nor was he required to under the regulations.

5. Navigation Lights

The "SEASPAN VALIANT" met the requirements of Rule 24 of the Collision Regulations and was exhibiting two masthead lights, sidelights, a sternlight, and a yellow towing light in a vertical line above the sternlight. All these lights were reported to be working properly on the night of the collision.

The fitting of sidelights on the barge "SEASPAN 610" was considered impracticable by the owners and in lieu of the sidelights one all-round white light was fitted at each end of the barge as prescribed in the Canadian modifications to Rule 24 of the Collision Regulations. As the barge was not subject to Canadian Coast Guard inspections the decision to fit the all-round white lights was that of the owners.

There is an electrical panel with a fuse box in the wheel-house of the tug which is referred to as a sentinel; when a navigation light on the tug stops functioning, a small indicator light goes on and a buzzer sounds an alarm to indicate which light is defective. The "SEASPAN VALIANT" was visited on October 16, 1986 and the buzzer was found to be inoperative. However, this was not considered to be a contributory cause of the casualty. Remedial action was immediately taken to repair the faulty buzzer.

When the "VIVIAN O" was first seen by the crew of the "SEASPAN VALIANT" she was exhibiting the correct lights under the Collision Regulations: i.e. two sidelights and the masthead light but her fishing lights were also lit.

The International Regulations for Preventing Collisions at Sea prescribe the navigation lights to be exhibited by a fishing vessel when engaged in fishing.

Rule 26(e) of the Collision Regulations states as follows:

> A vessel when not engaged in fishing shall not exhibit the lights or shapes prescribed in this Rule but only those prescribed for a vessel of her length.

It would appear that the "VIVIAN O" was in contravention of this rule as her fishing lights were also reported to be lit at the time of the collision and the switches for those lights were found in the 'on' position after the vessel had been righted and inspected. However, this fact is not considered to have contributed to the collision.

6. Look-out

Rule 5 of the Collision Regulations (Annex 1) requires every vessel to maintain a proper look-out by sight and hearing at all times and by all available means appropriate in the prevailing circumstances and conditions.

Typical of vessels carrying a small crew, the "SEASPAN VALIANT" did not have a crew member designated as a look-out. The master was navigating and the mate was steering the vessel visually and by radar through the fishing fleet. Both men were in the wheel-house as they entered the Fraser River and their main concern was to line the vessel on the range lights ahead with only an occasional glance astern.

The "VIVIAN O" does not appear to have maintained a proper look-out while crossing ahead of the barge prior to the collision. Her deck and mast floodlights were reported to

have been lit when the vessel was first sighted and with many bright lights shining on the deck, the night vision of an operator inside the wheel-house could have been impaired. Additionally, because the operating position was on the port side of the wheel-house, dangers on the starboard side might have been less obvious.

The prevailing circumstances; i.e. a dense concentration of fishing vessels in narrow waters, rain, mist, south-east winds of 15 to 25 knots and a light to moderate chop, would have been sufficient to require a designated and especially attentive look-out on both vessels.

7. **Safe Speed**

Rule 6 of the Collision Regulations (Annex II) requires every vessel to proceed at a safe speed at all times.

The factors to be taken into account by a vessel when determining a 'safe' speed include visibility, traffic density, manoeuvrability of the vessel, background light such as back scatter from her own lights and the state of the wind and sea.

The "SEASPAN VALIANT" was proceeding at an engine speed of 1100 r.p.m. out of a maximum of 1200, giving her a speed over the ground of approximately 4 to 5 knots. At the time of the collision, the maximum concentration of fishing vessels had been passed and no traffic was apparent immediately ahead.

The "VIVIAN O" appeared to have been proceeding at full speed because the clutch lever was found in the forward position and the throttle was in the wide open position. The "VIVIAN O" was reportedly capable of a full speed of approximately 7.5 knots and she would therefore appear to have been overtaking the tug and tow at the time of the casualty.

8. **Risk of Collision**

Rule 7 of the Collision Regulations (Annex III) requires every vessel to use all available means to determine if risk of collision exists.

The first sighting of the "VIVIAN O" by the crew of the "SEASPAN VALIANT" is thought to have occurred immediately prior to the collision. The radar used on the "SEASPAN VALIANT" was on the 1.5 mile range with an occasional switch to the higher ranges to check on traffic ahead. Another small fishing vessel with all her deck lights on, and

seemingly stopped and hauling in her nets, was visually sighted ahead, near the Steveston Jetty, some two minutes earlier and was the only vessel noticed in the area.

Sea clutter, due to the moderate chop on the water, made it more difficult for the crew of the "SEASPAN VALIANT" to detect small radar echoes at close range. Although all vessels observed visually were also detected on radar the echo of the "VIVIAN O" might have been lost in the clutter, or due to the proximity of the barge and the fishing vessel their echoes could have overlapped or merged.

The "VIVIAN O" had a radar on board that was reported to be working satisfactorily; however it was turned off and fitted with a cover at the time of the collision. This would appear to be a breach of Rule 7(b) which requires that proper use be made of radar equipment if fitted and operational.

The same rule requires that every vessel shall use all available means appropriate to the prevailing circumstances to determine if risk of collision exists.

The "VIVIAN O" was fitted with a VHF radiotelephone but no call was heard or received from her.

9. Overtaking and Crossing

Rule 13 (Annex IV) of the Collision Regulations requires that any vessel overtaking any other vessel shall keep out of the way of the vessel being overtaken. The "SEASPAN VALIANT" and the barge were moving at between 4 and 5 knots with the "VIVIAN O" overtaking apparently at a full speed of 7.5 knots.

Since the mate on the "SEASPAN VALIANT" reported seeing the two sidelights of the fishing vessel astern, it would appear that the fishing vessel was overtaking and therefore in violation of Rule 13 of the Collision Regulations or, if the fishing vessel was not overtaking, i.e., that she was crossing the river at an angle of less than 22.5° aft of the beam of the "SEASPAN VALIANT" (Fig.1), she was contravening Rule 15 (Annex V) of the Collision Regulations by not keeping clear of the vessel on her starboard side.

10. Action by Stand-on Vessel

Rule 17 of the Collision Regulations (Annex V) requires the stand-on vessel to take action to avoid collision only when it becomes apparent that the vessel required to keep out of the way is not taking appropriate action to comply.

The master of the "SEASPAN VALIANT", once aware of the close quarters situation between the fishing vessel and the barge, reduced the tug's speed in order to assess the situation, he then stopped the tug's engine when it became apparent that a serious casualty was imminent. The reduction in speed and stoppage of the tug's engine would reduce the tug's speed rapidly, but the loaded barge would reduce speed less quickly due to its momentum and inertia.

Rule 36 of the Collision Regulations states as follows:

> If necessary to attract the attention of another vessel any vessel may make light or sound signals that cannot be mistaken for any signal authorized elsewhere in these Rules, or may direct the beam of her searchlight in the direction of the danger, in such a way as not to embarrass any vessel. Any light to attract the attention of another vessel shall be such that it cannot be mistaken for any aid to navigation. For the purpose of this rule the use of high intensity intermittent or revolving lights, such as strobe lights, shall be avoided.

Signals for the above purpose were made by the "SEASPAN VALIANT" when navigating through the heavy concentration of fishing vessels i.e., a searchlight shining ahead indicating her intended course and the sounding of whistle blasts. The barge "SEASPAN 610" was not illuminated by the tug's searchlight due to the blinding effect it might have have on other vessels in the area.

The crew of the "SEASPAN VALIANT" were unable to visually signal the "VIVIAN O" nor did they attempt to use the emergency signal as required by Rule 36, of the Collision Regulations, because the interval between the time they first saw the fishing vessel and the time of the collision was reportedly too short.

11. Recovered Condition of the "VIVIAN O"

The mast, booms and rigging of the "VIVIAN O" were found damaged by what appeared to have been the pounding of the vessel on the river bed as she was being towed upriver. The net was on the drum and there was an extra net stowed in the fish hold. There were no fish in the hold which was empty except for the net. The wheel-house windows were broken, probably due to water pressure, as the wheel-house did not appear to be distorted. There was a hole approximately 49 cm^2 and 15 cm deep in the bottom of the hull at amidships on

the starboard side. The hole is thought to have been made by the shackle or chain from the towing bridles of the barge piercing the hull as the "VIVIAN O" was rolled over by the bow of the barge "SEASPAN 610". About 30 cm aft of this hole, the keel showed a sharp cut across the timber. The ignition key was in the 'on' position, the clutch was in the forward position with the throttle wide open, and the automatic pilot was in the 'off' position. The depth sounder was 'off' and the CB and VHF radios were 'on' but since they both had an electronic digital readout, the channels in use are unknown. The navigation and fishing light switches were turned 'on' and the radar was switched off with the hood cover on. The steering gear was found to be operating normally.

12. Life-Saving Appliances "VIVIAN O"

The Small Fishing Vessel (SFV) Inspection Regulations, Part II, Section 30, state in part, as follows:

> Life Saving Equipment
>
> 30.(1) In this section and in section 31, "approved", when used in reference to an article, means that the article has been built in accordance with the standards therefor in the Life Saving Equipment Regulations and has been approved by the Board.
>
> (2) Every fishing vessel of open construction not exceeding 12.2 m in length shall carry
>
> (a) one approved lifejacket for each person or one approved lifebuoy for every two persons on board the vessel; and
>
> (b) one approved lifebuoy fitted with 27 m of line, but such lifebuoy need not be additional to any lifebuoys carried pursuant to paragraph (1).

Because SFV's are not required to be inspected by the Ship Safety Branch of the Canadian Coast Guard, the responsibility to carry the above equipment rests solely with the owner and operator. The one life-vest and one lifering found on board were not 'approved' as defined above, however it is possible that the required equipment was carried in addition to that already mentioned and became lost during or after the collision.

Whether or not approved equipment was carried is not considered a contributing factor in the collision.

13. Publications for Fishermen

There are presently three publications available to fishermen; two are published by the Canadian Coast Guard and the third, by the Joint Fishing Industry Safety and Health Committee (Joint F.I.S.H. Committee).

Part II, of the "Fishermen's Safety Manual", published by the Joint F.I.S.H. Committee, deals with navigation and advises the reader to refer to the Ministry of Transport (M.O.T.) regulations for a complete listing of rules, and proceeds to illustrate the basic priorities of vessels as specified in the Rules of the Road.

Section E of Part II, mentions and illustrates the towing lights and shapes required for a vessel when towing or being towed; para 1(b) describes and illustrates the yellow towing light placed above the stern light.

The "Manual of Safety and Health for Fishermen" published by the Canadian Coast Guard, Chapter 2, deals with navigation and paragraph 2.2.5 states that the Collision Regulations shall be strictly observed at all times.

Paragraph 2.2.3 of the "Manual of Safety and Health for Fishermen" further states that a proper look-out must be kept at all times, especially when on automatic steering.

The third publication titled "Safety Handbook for the Inshore Fisherman" is published by the Canadian Coast Guard and the information contained in the guide applies primarily to commercial fishing vessels not exceeding 15 tons gross and therefore not subject to regulatory inspections by the Ship Safety Branch of the Canadian Coast Guard. It lists the equipment required under the Small Fishing Vessel Inspection Regulations and the Collision Regulations.

The section titled "Operating Regulations" illustrates that any vessel overtaking another must keep clear.

In the section titled "Navigation Lights" (Collision Regulations), the lights and shapes used by fishermen are described and illustrated but towing lights and shapes are not mentioned.

The foregoing booklets are available free of charge to every fisherman and a copy of the Collision Regulations can be purchased from many bookstore agents and other bookstores in

Canada for a nominal fee.

On vessels of less than 100 gross tons, the responsibility rests with the individual fisherman to make full use of the information available, as there is no regulatory requirement for an examination to test his understanding.

14. Experience

The master of the "SEASPAN VALIANT" has held a Master Home Trade (350T) Certificate (originally classified as Towboat Master's Certificate) since 1962. He has 19 years experience on coastal tugs, with 5 years experience as master of a harbour tug in Victoria. He has navigated through fishing fleets and the Fraser River on countless occasions. His overall sea time on the British Columbia coast is 31 years, 30 of which were as officer and master.

The mate of the "SEASPAN VALIANT" is the holder of a Master Home Trade (350T) Certificate and has worked on tugs since 1967 as a mate and master. He held a regular posting as master for 3 years but reductions in personnel caused him to be reclassified as relief master and mate. In this capacity, he has served on the "SEASPAN VALIANT" intermittently for 3 years.

The operator of the "VIVIAN O" did not hold a certificate of competency, nor was he required by regulation to have one. There are no reports of his having attended any marine courses or emergency training. In his country of origin the operator is reported to have sailed on small coastal vessels but further details are unavailable.

He commenced fishing in Canada in 1974 as a deck-hand and engineer on larger seine fishing vessels, mainly operating on the west coast of Vancouver Island. Although he had been fishing for a number of years, it is believed that this was his first fishing experience on the Fraser River.

In December 1985, after 12 years fishing experience, he and his wife purchased the "VIVIAN O".

15. Autopsy

Postmortem examinations were conducted on both deceased the day following the casualty. Diagnoses indicated that drowning was the cause of death and that there was no alcohol in the bloodstream of either crew member. The operator of the "VIVIAN O" was known to be a diabetic who required daily insulin treatment. This sickness was confirmed during the autopsy but it could not be ascertained

when the last insulin was self-administered. No diabetic kit was found on board his vessel although it may have been lost during the rescue attempts.

Consequently, it cannot be determined whether the diabetic condition contributed in any way to the cause of the casualty.

Findings

On September 29, 1986, the small fishing vessel "VIVIAN O" while upbound, at the mouth of the Fraser River, entered into a collision with the barge "SEASPAN 610" which was towed by the tug "SEASPAN VALIANT". The "VIVIAN O" capsized and her two crew members drowned when they were trapped inside the forward compartment.

With due consideration to the fact that the evidence of the crew from the "VIVIAN O" was not available, it would appear that the collision was caused by the following factors:

- the failure of those on the "VIVIAN O" to maintain a proper look-out as required by Rule 5 of the International Collision Regulations;

- the failure of the "VIVIAN O" to give way either as an overtaking vessel as required by Rule 13, or as a crossing vessel, as required by Rule 15 of the International Collision Regulations;

- the failure of those on the "SEASPAN VALIANT" to maintain a proper look-out as required by Rule 5 of the International Collision Regulations, inasmuch as they did not detect the risk of a collision developing astern until too late;

Also it would appear that the following factors involving the "VIVIAN O" may also have contributed to the collision:

- the collision occurred late at night after the crew had fished for some 28 hours in poor weather conditions and they may have been fatigued;

- weather conditions remained poor for a small boat inasmuch as heavy driving spray would have affected visibility;

- the steering position, and the only window with a windshield wiper were on the port side of the vessel's wheel-house;

- the relatively high positioning of the navigation lights on the barge made them more difficult to see at close range; and

- failure on the part of the "VIVIAN O" to make use of the radar on board the vessel.

Other Findings

The operator of the "VIVIAN O" was a diabetic, but whether this factor had any bearing on the collision and its outcome, cannot be determined.

OTTAWA, ONTARIO
APRIL 1987.

Glossary

CB	- Citizen Band
CONSTRUCTIVE TOTAL LOSS	- When the cost of repairing a vessel exceeds the market value of the vessel when repaired
FISHERIES OPENING	- Fishermen are allowed to fish a given area within an allotted time
KEEL	- The main centre line structural member running fore and aft along the bottom of a ship
'MAYDAY'	- A distress message transmitted by radiotelephone
Range Lights	- Two lights, vertically disposed, to indicate a course to steer or a danger to avoid
Sea clutter	- Echoes on a radar PPI (radar screen) caused by the reflection of pulses from the sloping sides of waves
Short, Steep Seas	- Seas with a shorter than normal distance between crests
STAND ON VESSEL	- The vessel that is obliged to keep her course and speed in a crossing situation
STOOD DOWN	- When a vessel is relieved of her duties
SSB	- Single Side Band Radio
UTC	- Co-ordinated Universal Time
VHF	- Very High Frequency

ANNEX I

PART B—STEERING AND SAILING RULES

SECTION I—CONDUCT OF VESSELS IN ANY CONDITION OF VISIBILITY

RULE 4

Application

Rules in this Section apply in any condition of visibility.

RULE 5

Look-out

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

APPENDICE I

PARTIE B—RÈGLES DE BARRE ET DE ROUTE

SECTION I—CONDUITE DES NAVIRES DANS TOUTES LES CONDITIONS DE VISIBILITE

RÈGLE 4

Champ d'application

Les règles de la présente section s'appliquent dans toutes les conditions de visibilité.

RÈGLE 5

Veille

Tout navire doit en permanence assurer une veille visuelle et auditive appropriée, en utilisant également tous les moyens disponibles qui sont adaptés aux circonstances et conditions existantes, de manière à permettre une pleine appréciation de la situation et du risque d'abordage.

ANNEX II

RULE 6

Safe Speed—International

Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

In determining a safe speed the following factors shall be among those taken into account:

(*a*) By all vessels:

(i) the state of visibility,

(ii) the traffic density including concentrations of fishing vessels or any other vessels,

(iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions,

(iv) at night the presence of background light such as from shore lights or from back scatter of her own lights,

(v) the state of wind, sea and current, and the proximity of navigational hazards,

(vi) the draught in relation to the available depth of water.

(*b*) Additionally, by vessels with operational radar:

(i) the characteristics, efficiency and limitations of the radar equipment,

(ii) any constraints imposed by the radar range scale in use,

(iii) the effect on radar detection of the sea state, weather and other sources of interference,

(iv) the possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range,

(v) the number, location and movement of vessels detected by radar,

(vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

Safe Speed—Canadian Modifications

(*c*) In the Canadian waters of a roadstead, harbour, river, lake or inland waterway, every vessel passing another vessel or work that includes a dredge, tow, grounded vessel or wreck shall proceed with caution at a speed that will not adversely affect the vessel or work being passed, and shall take into consideration applicable information contained in any Notice to Mariners or Notice to Shipping.

(*d*) For the purpose of paragraph (*c*), where it cannot be determined with certainty that a passing vessel will not adversely affect another vessel or work described in that paragraph, the passing vessel shall proceed with caution

APPENDICE II

RÈGLE 6

Vitesse de sécurité—International

Tout navire doit maintenir en permanence une vitesse de sécurité telle qu'il puisse prendre des mesures appropriées et efficaces pour éviter un abordage et pour s'arrêter sur une distance adaptée aux circonstances et conditions existantes.

Les facteurs suivants doivent notamment être pris en considération pour déterminer la vitesse de sécurité:

a) Par tous les navires:

(i) la visibilité;

(ii) la densité du trafic et notamment les concentrations de navires de pêche ou de tous autres navires;

(iii) la capacité de manœuvre du navire et plus particulièrement sa distance d'arrêt et ses qualités de giration dans les conditions existantes;

(iv) de nuit, la présence d'un arrière-plan lumineux tel que celui créé par des feux côtiers ou une diffusion de la lumière des propres feux du navire;

(v) l'état du vent, de la mer et des courants et la proximité de risques pour la navigation;

(vi) le tirant d'eau en fonction de la profondeur d'eau disponible.

b) De plus, par les navires qui utilisent un radar:

(i) les caractéristiques, l'efficacité et les limites d'utilisation de l'équipement radar;

(ii) les limitations qui résultent de l'échelle de portée utilisée sur le radar;

(iii) l'effet de l'état de la mer, des conditions météorologiques et d'autres sources de brouillage sur la détection au radar;

(iv) le fait que les petits bâtiments, les glaces et d'autres objets flottants peuvent ne pas être décelés par le radar à une distance suffisante;

(v) le nombre, la position et le mouvement des navires détectés par le radar;

(vi) le fait qu'il est possible d'apprécier plus exactement la visibilité lorsque le radar est utilisé pour déterminer la distance des navires et des autres objets situés dans les parages.

Vitesse de sécurité—Modifications canadiennes

c) Dans les eaux canadiennes d'une rade, d'un port, d'un cours d'eau, d'un lac ou d'une voie navigable intérieure, tout navire qui dépasse un autre navire ou un ouvrage, notamment une drague, un train de remorque, un navire échoué ou une épave, doit passer prudemment à une vitesse qui n'aura pas d'effet néfaste sur le navire ou l'ouvrage dépassé et il doit tenir compte des renseignements applicables contenus dans un Avis aux navigateurs ou un Avis à la navigation.

d) Lorsque, aux fins de l'alinéa *c*), il est impossible de déterminer avec certitude que le passage d'un navire n'aura pas d'effet néfaste sur un autre navire ou sur un ouvrage décrit audit alinéa, le navire passant doit avancer

at the minimum speed at which she can be kept on her course.

(e) In the Canadian waters of a roadstead, harbour, river, lake or inland waterway, where abnormal water levels, ice conditions or a casualty to a vessel or aid to navigation may

(i) make navigation difficult or hazardous,

(ii) cause damage to property, or

(iii) block the navigational channel,

every vessel shall navigate with caution and shall take into consideration the applicable information contained in any Notice to Mariners or Notice to Shipping with respect to speed, routing and anchorage.

prudemment à la vitesse minimale nécessaire pour le maintenir sur sa route.

e) Dans les eaux canadiennes d'une rade, d'un port, d'un cours d'eau, d'un lac ou d'une voie navigable intérieure, tout navire doit naviguer prudemment et tenir compte des renseignements applicables contenus dans un Avis aux navigateurs ou un Avis à la navigation relativement à la vitesse, à l'organisation du trafic et au mouillage, lorsqu'un niveau d'eau ou un état des glaces anormaux ou un sinistre subi par un navire ou par une aide à la navigation peuvent

(i) rendre la navigation difficile ou dangereuse,

(ii) endommager des biens, ou

(iii) bloquer le chenal servant à la navigation.

ANNEX III

RULE 7

Risk of Collision

(*a*) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.

(*b*) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(*c*) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

(*d*) In determining if risk of collision exists the following considerations shall be among those taken into account:

(i) such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change,

(ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

APPENDICE III

REGLE 7

Risque d'abordage

a) Tout navire doit utiliser tous les moyens disponibles qui sont adaptés aux circonstances et conditions existantes pour déterminer s'il existe un risque d'abordage. S'il y a doute quant au risque d'abordage, on doit considérer que ce risque existe.

b) S'il y a à bord un équipement radar en état de marche, on doit l'utiliser de façon appropriée en recourant, en particulier, au balayage à longue portée afin de déceler à l'avance un risque d'abordage, ainsi qu'au «plotting» radar ou à toute autre observation systématique équivalente des objets détectés.

c) On doit éviter de tirer des conclusions de renseignements insuffisants, notamment de renseignements radar insuffisants.

d) L'évaluation d'un risque d'abordage doit notamment tenir compte des considérations suivantes:

(i) il y a risque d'abordage si le relèvement au compas d'un navire qui s'approche ne change pas de manière appréciable;

(ii) un tel risque peut parfois exister même si l'on observe une variation appréciable du relèvement, particulièrement lorsque l'on s'approche d'un très grand navire, d'un train de remorque ou d'un navire qui est à courte distance.

ANNEX IV

RULE 13

Overtaking—International

(*a*) Notwithstanding anything contained in the Rules of Part B, Sections I and II, any vessel overtaking any other vessel shall keep out of the way of the vessel being overtaken.

(*b*) A vessel shall be deemed to be overtaking when coming up with another vessel from a direction more than 22.5 degrees abaft her beam, that is, in such a position with reference to the vessel she is overtaking, that at night she would be able to see only the sternlight of that vessel but neither of her sidelights.

(*c*) When a vessel is in any doubt as to whether she is overtaking another, she shall assume that this is the case and act accordingly.

(*d*) Any subsequent alteration of the bearing between the two vessels shall not make the overtaking vessel a crossing vessel within the meaning of these Rules or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

APPENDICE IV

REGLE 13

Navire qui en rattrape un autre—International

a) Nonobstant toute disposition des règles des sections I et II de la partie B, tout navire qui en rattrape un autre doit s'écarter de la route de ce dernier.

b) Doit se considérer comme en rattrapant un autre un navire qui s'approche d'un autre navire en venant d'une direction de plus de 22.5 degrés sur l'arrière du travers de ce dernier, c'est-à-dire qui se trouve dans une position telle, par rapport au navire rattrapé, que, de nuit, il pourrait voir seulement le feu arrière de ce navire, sans voir aucun de ses feux de côté.

c) Lorsqu'un navire ne peut déterminer avec certitude s'il en rattrape un autre, il doit se considérer comme un navire qui en rattrape un autre et manœuvrer en conséquence.

d) Aucun changement ultérieur dans le relèvement entre les deux navires ne peut faire considérer le navire qui rattrape l'autre comme croisant la route de ce dernier au sens des présentes règles ni l'affranchir de l'obligation de s'écarter de la route du navire rattrapé jusqu'à ce qu'il soit tout à fait paré et clair.

ANNEX V

RULE 15

Crossing Situation—International

(*a*) When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

Crossing Situation—Canadian Modification

(*b*) Notwithstanding paragraph (*a*), in Canadian waters, a vessel crossing a river shall keep out of the way of a power-driven vessel ascending or descending the river, except on the St. Lawrence River northeast of Red Islet.

RULE 16

Action by Give-way Vessel

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

RULE 17

Action by Stand-on Vessel

(*a*) (i) Where one of two vessels is to keep out of the way, the other shall keep her course and speed.

(ii) The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(*b*) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

(*c*) A power-driven vessel which takes action in a crossing situation in accordance with subparagraph (*a*)(ii) of this Rule to avoid collision with another power-driven vessel shall, if the circumstances of the case admit, not alter course to port for a vessel on her own port side.

(*d*) This Rule does not relieve the give-way vessel of her obligation to keep out of the way.

APPENDICE V

RÈGLE 15

Navires dont les routes se croisent—International

a) Lorsque deux navires à propulsion mécanique font des routes qui se croisent de telle sorte qu'il existe un risque d'abordage, le navire qui voit l'autre navire sur tribord doit s'écarter de la route de celui-ci et, si les circonstances le permettent, éviter de croiser sa route sur l'avant.

Navires dont les routes se croisent—Modification canadienne

b) Nonobstant l'alinéa *a*), dans les eaux canadiennes, un navire traversant une rivière, sauf le fleuve Saint-Laurent au nord-est d'Ilet Rouge doit s'écarter de la route d'un navire à propulsion mécanique remontant ou descendant cette rivière.

RÈGLE 16

Manœuvre du navire non privilégié

Tout navire qui est tenu de s'écarter de la route d'un autre navire doit, autant que possible, manœuvrer de bonne heure et franchement de manière à s'écarter largement.

RÈGLE 17

Manœuvre du navire privilégié

a) (i) Lorsqu'un navire est tenu de s'écarter de la route d'un autre navire, cet aûtre navire doit maintenir son cap et sa vitesse.

(ii) Néanmoins, ce dernier peut manœuvrer, afin d'éviter l'abordage par sa seule manœuvre, aussitôt qu'il lui paraît évident que le navire qui est dans l'obligation de s'écarter de sa route n'effectue pas la manœuvre appropriée prescrite par les présentes règles.

b) Quand, pour une cause quelconque, le navire qui est tenu de maintenir son cap et sa vitesse se trouve tellement près de l'autre que l'abordage ne peut être évité par la seule manœuvre du navire qui doit laisser la route libre, il doit de son côté faire la manœuvre qui est la meilleure pour aider à éviter l'abordage.

c) Un navire à propulsion mécanique qui manœuvre pour éviter un abordage avec un autre navire à propulsion mécanique dont la route croise la sienne dans les conditions prévues à l'alinéa *a*)(ii) de la présente règle ne doit pas, si les circonstances le permettent, abattre sur bâbord lorsque l'autre navire est bâbord à lui.

d) La présente règle ne saurait dispenser le navire qui doit laisser la route libre de l'obligation de s'écarter de la route de l'autre navire.

ANNEX VI

RULE 24

Towing and Pushing—International

(*a*) A power-driven vessel when towing shall exhibit:

(i) instead of the light prescribed in Rule 23(*a*)(i) or (*a*)(ii), two masthead lights in a vertical line. When the length of the tow, measuring from the stern of the towing vessel to the after end of the tow exceeds 200 metres, three such lights in a vertical line,

(ii) sidelights,

(iii) a sternlight,

(iv) a towing light in a vertical line above the sternlight,

(v) when the length of the tow exceeds 200 metres, a diamond shape where it can best be seen.

(*b*) When a pushing vessel and a vessel being pushed ahead are rigidly connected in a composite unit they shall be regarded as a power-driven vessel and exhibit the lights prescribed in Rule 23.

(*c*) A power-driven vessel when pushing ahead or towing alongside, except in the case of a composite unit, shall exhibit:

(i) instead of the light prescribed in Rule 23(*a*)(i) or (*a*)(ii), two masthead lights in a vertical line,

(ii) sidelights,

(iii) a sternlight.

(*d*) A power-driven vessel to which paragraph (*a*) or (*c*) of this Rule applies shall also comply with Rule 23(*a*)(ii).

(*e*) A vessel or object being towed, other than those mentioned in paragraph (*g*) or this Rule, shall exhibit:

(i) sidelights,

(ii) a sternlight,

(iii) when the length of the tow exceeds 200 metres, a diamond shape where it can best be seen.

APPENDICE VI

RÈGLE 24

Remorquage et poussage—International

a) Un navire à propulsion mécanique en train de remorquer doit montrer:

(i) au lieu du feu prescrit par la règle 23*a*)(i) ou par la règle 23*a*)(ii), deux feux de tête de mât superposés. Lorsque la longueur du train de remorque mesurée de l'arrière du navire remorquant à l'extrémité arrière du train de remorque dépasse 200 mètres, il doit montrer trois de ces feux superposés;

(ii) des feux de côté;

(iii) un feu de poupe;

(iv) un feu de remorquage placé à la verticale au-dessus du feu de poupe;

(v) à l'endroit le plus visible, lorsque la longueur du train de remorque dépasse 200 mètres, une marque biconique.

b) Un navire en train de pousser et un navire poussé en avant reliés par un raccordement rigide de manière à former une unité composite doivent être considérés comme un navire à propulsion mécanique et montrer les feux prescrits par la règle 23.

c) Un navire à propulsion mécanique en train de pousser en avant ou de remorquer à couple doit, sauf s'il s'agit d'une unité composite, montrer:

(i) au lieu du feu prescrit par la règle 23*a*)(i) ou par la règle 23*a*)(ii), deux feux de tête de mât superposés;

(ii) des feux de côté;

(iii) un feu de poupe.

d) Un navire à propulsion mécanique auquel les dispositions des alinéas *a*) ou *c*) de la présente règle s'appliquent, doit également se conformer aux dispositions de la règle 23*a*)(ii).

e) Un navire ou objet remorqué autre que ceux mentionnés à l'alinéa *g*) de la présente règle doit montrer:

(i) des feux de côté;

(ii) un feu de poupe;

(iii) à l'endroit le plus visible, lorsque la longueur du train de remorque dépasse 200 mètres, une marque biconique.

(f) Provided that any number of vessels being towed alongside or pushed in a group shall be lighted as one vessel,

(i) a vessel being pushed ahead, not being part of a composite unit, shall exhibit at the forward end, sidelights,

(ii) a vessel being towed alongside shall exhibit a sternlight and at the forward end, sidelights.

(g) An inconspicuous, partly submerged vessel or object, or combination of such vessels or objects being towed, shall exhibit:

(i) if it is less than 25 metres in breadth, one all-round white light at or near the forward end and one at or near the after end except that dracones need not exhibit a light at or near the forward end,

(ii) if it is 25 metres or more in breadth, two additional all-round white lights at or near the extremities of its breadth,

(iii) if it exceeds 100 metres in length, additional all-round white lights between the lights prescribed in subparagraphs (i) and (ii) so that the distance between the lights shall not exceed 100 metres,

(iv) a diamond shape at or near the aftermost extremity of the last vessel or object being towed and if the length of the tow exceeds 200 metres an additional diamond shape where it can best be seen and located as far forward as is practicable.

(h) Where from any sufficient cause it is impracticable for a vessel or object being towed to exhibit the lights or shapes prescribed in paragraph (e) or (g) of this Rule, all possible measures shall be taken to light the vessel or object towed or at least to indicate the presence of such vessel or object.

(i) Where from any sufficient cause it is impracticable for a vessel not normally engaged in towing operations to display the lights prescribed in paragraph (a) or (c) of this Rule, such vessel shall not be required to exhibit those lights when engaged in towing another vessel in distress or otherwise in need of assistance. All possible measures shall be taken to indicate the nature of the relationship between the towing vessel and the vessel being towed as authorized by Rule 36, in particular by illuminating the towline.

Towing and Pushing—Canadian Modifications

(j) Notwithstanding paragraphs (e) and (h), within Canadian waters or fishing zones, where it is impracticable for a barge being towed to comply with paragraph (e) the barge shall exhibit the lights prescribed in paragraph (k) to (m).

f) Étant entendu que les feux d'un nombre quelconque de navires remorqués à couple ou poussés en groupe doivent correspondre à ceux d'un seul navire,

(i) un navire poussé en avant, ne faisant pas partie d'une unité composite, doit montrer à son extrémité avant des feux de côté;

(ii) un navire remorqué à couple doit montrer un feu de poupe et, à son extrémité avant, des feux de côté.

g) Un navire ou objet remorqué qui est partiellement submergé et difficile à apercevoir, ou un ensemble de ces navires ou objets remorqués, doit montrer:

(i) lorsque sa largeur est inférieure à 25 mètres, un feu blanc visible sur tout l'horizon à l'extrémité avant ou à proximité de celle-ci et un autre à l'extrémité arrière ou à proximité de celle-ci, exception faite des dracones, qui ne sont pas tenues de montrer un feu à leur extrémité avant ou à proximité de celle-ci;

(ii) lorsque sa largeur est égale ou supérieure à 25 mètres, deux feux blancs supplémentaires visibles sur tout l'horizon aux extrémités de sa largeur ou à proximité de celles-ci;

(iii) lorsque sa longueur est supérieure à 100 mètres, des feux blancs supplémentaires visibles sur tout l'horizon entre les feux prescrits aux sous-alinéas (i) et (ii) de telle sorte que la distance entre les feux ne soit pas supérieure à 100 mètres;

(iv) une marque biconique à l'extrémité arrière ou près de l'extrémité arrière du dernier navire ou objet remorqué et, lorsque la longueur du train de remorque est supérieure à 200 mètres, une marque biconique supplémentaire à l'endroit le plus visible et le plus à l'avant possible.

h) Si, pour une raison suffisante, le navire ou l'objet remorqué est dans l'impossibilité de montrer les feux ou les marques prescrits aux alinéas e) ou g) de la présente règle, toutes les mesures possibles sont prises pour éclairer le navire ou l'objet remorqué ou tout au moins pour indiquer la présence d'un tel navire ou objet.

i) Si, pour une raison suffisante, un navire qui n'effectue pas ordinairement des opérations de remorquage est dans l'impossibilité de montrer les feux prescrits aux alinéas a) ou c) de la présente règle, ce navire n'est pas tenu de montrer ces feux lorsqu'il procède au remorquage d'un autre navire en détresse ou ayant besoin d'une assistance pour d'autres raisons. Toutes les mesures possibles doivent être prises pour indiquer de la manière autorisée par la règle 36, notamment en éclairant le câble de remorquage, le rapport entre le navire remorqueur et le navire remorqué.

Remorquage et poussage—Modifications canadiennes

j) Nonobstant les alinéas e) et h), dans les eaux ou les zones de pêche canadiennes, lorsqu'il est impossible pour un chaland se faisant tirer de se conformer à l'alinéa e), le chaland doit allumer les lumières prescrites aux alinéas k) à m).

(*k*) Subject to paragraphs (*l*) to (*n*), every barge shall carry one all-round white light at each end of the barge.

(*l*) Where two or more barges are grouped together, the group may be lighted as a single barge.

(*m*) Subject to paragraph (*n*), where two or more barges are grouped together, the total length of the group exceeds 100 metres and the group is lighted as a single barge, the group shall carry an all-round white light located as closely as possible at the middle point of the group, in addition to the lights prescribed in paragraph (*k*).

(*n*) A barge being pushed ahead shall carry, instead of the all-round white lights prescribed in paragraphs (*k*) and (*m*), white lights that show an unbroken light over an arc of the horizon of 225 degrees and are fixed so as to show the light from right ahead to 22.5 degrees abaft the beam on either side of the barge.

(*o*) Notwithstanding paragraph (*c*), in the waters of the Great Lakes Basin, a power-driven vessel when pushing ahead or towing alongside shall exhibit two towing lights in a vertical line instead of the sternlight prescribed in paragraph (*c*).

(*p*) In the Canadian waters of a roadstead, harbour, river, lake or inland waterway, a special flashing light shall be exhibited at the forward end of a vessel or vessels being pushed ahead, in addition to the lights prescribed in paragraphs (*f*) and (*n*).

k) Sous réserve des alinéas *l*) à *n*), un chaland doit être doté à chaque extrémité d'un feu blanc visible sur tout l'horizon.

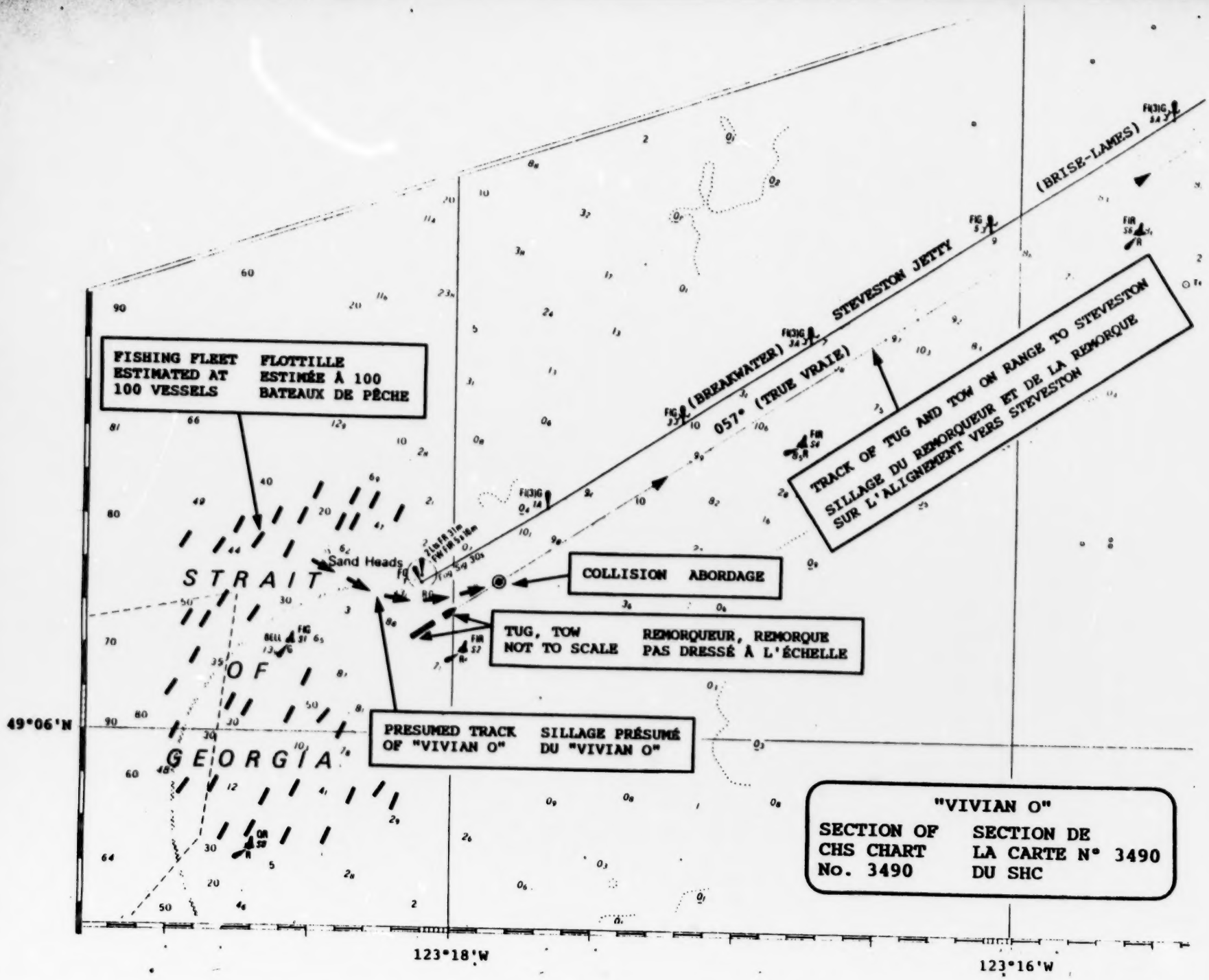
l) Il est permis, lorsque deux chalands ou plus sont groupés, de les éclairer comme un chaland unique.

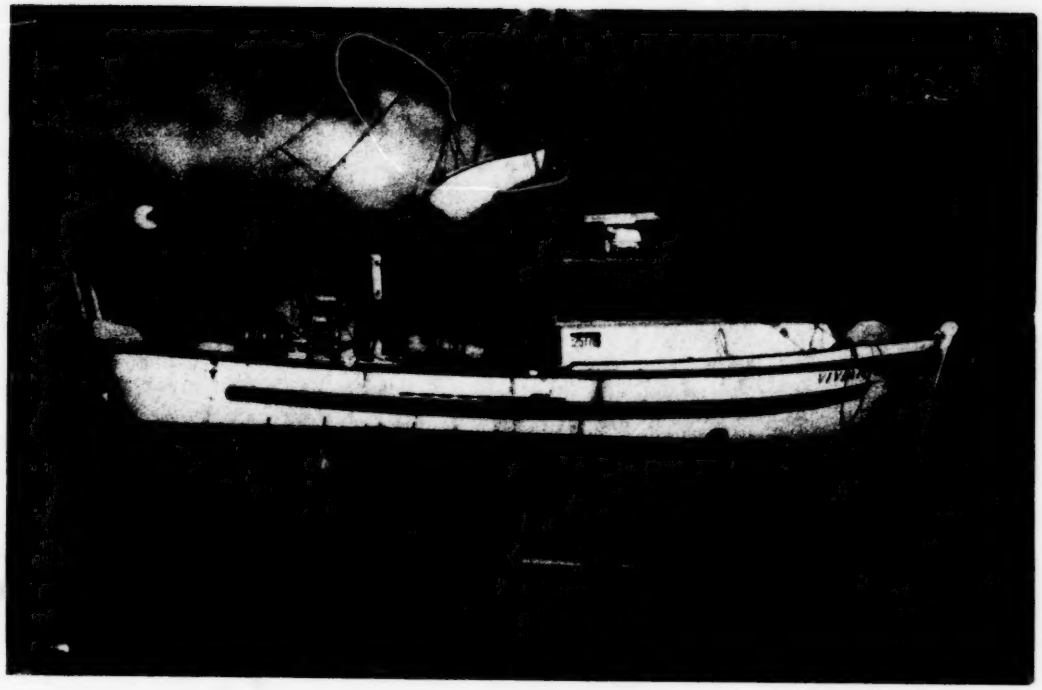
m) Sous réserve de l'alinéa *n*), lorsque deux chalands ou plus sont groupés, que la longueur totale du groupe dépasse 100 mètres et que le groupe est éclairé comme un chaland unique, le groupe doit être doté, en plus des feux prescrits à l'alinéa *k*), d'un feu blanc visible sur tout l'horizon, placé aussi près que possible du centre du groupe.

n) Un chaland poussé en avant doit être doté, au lieu des feux blancs visibles sur tout l'horizon visés aux alinéas *k*) et *m*), de feux blancs projetant une lumière ininterrompue sur tout le parcours d'un arc d'horizon de 225 degrés et disposés de manière à projeter cette lumière depuis l'avant jusqu'à 22,5 degrés sur l'arrière du travers de chaque bord.

o) Nonobstant l'alinéa *c*), un navire à propulsion mécanique qui dans les eaux du Bassin des Grands lacs, pousse en avant ou remorque à couple doit montrer deux feux de remorquage superposés plutôt que le feu de poupe visé à l'alinéa *c*).

p) Dans les eaux canadiennes d'une rade, d'un port, d'un cours d'eau, d'un lac ou d'une voie navigable intérieure, un ou plusieurs des navires poussés en avant doivent montrer à l'avant un feu à éclats spécial, en plus des feux visés aux alinéas *f*) et *n*).


FISHING FLEET ESTIMATED AT 100 VESSELS
FLOTTILLE ESTIMÉE À 100 BATEAUX DE PÊCHE
(BREAKWATER)
STEVESTON JETTY
(BRISE-LAMES)
057° (TRUE VRAIE)
TRACK OF TUG AND TOW ON RANGE TO STEVESTON
SILLAGE DU REMORQUEUR ET DE LA REMORQUE SUR L'ALIGNEMENT VERS STEVESTON
Sand Heads
STRAIT
OF
GEORGIA
COLLISION ABORDAGE
TUG, TOW NOT TO SCALE
REMORQUEUR, REMORQUE PAS DRESSÉ À L'ÉCHELLE
PRESUMED TRACK OF "VIVIAN O"
SILLAGE PRÉSUMÉ DU "VIVIAN O"
49°06'N
123°18'W
123°16'W
"VIVIAN O"
SECTION OF CHS CHART No. 3490
SECTION DE LA CARTE N° 3490 DU SHC



F/V "VIVIAN O"

B.P. "VIVIAN O"

Steering position.
Poste de barre.

Entrance to
forward compartment.

Descente vers
le compartiment avant.

Hull damage
(covered by divers).

Avaries à la coque
(recouverte par les plongeurs).

Quille tronçonnée par
un objet tranchant.

Barge "SEASPAN 610"

Le chaland "SEASPAN 610"